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Legal Patents  
Wilmington, DE 19898

EXAMINER
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CHEUNG, WILLIAM K

ART UNIT	PAPER NUMBER
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1713

DATE MAILED: 10/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/501,598

Applicant(s)

RYMER ET AL.

Examiner

William K. Cheung

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 18 August 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,2,10-12,14-16,18,20-41 and 46-68 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2,10-12,14-16,18,20-41 and 46-68 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_.

### **DETAILED ACTION**

1. In view of the amendment filed August 18,2006, claims 9, 19, 42-45 have been cancelled, and new claims 58-68 have been added. Claims 1, 2, 10-12, 14-16, 18, 20-41, 46-68 are pending.
2. In view of the amendment filed August 18,2006, the rejection of Claims 1, 2, 24, 31-34, 40-50, 54-56 under 35 U.S.C. 103(a) as being unpatentable over Gutweiler (US Patent 5,573,842) in view of Dauvergne (FR Patent 2,401,941, Abstract), and Shohi et al. (EP-1036775 A1), is withdrawn. Further, the rejection of Claims 14-16, 18-21, 23, 57 under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Gutweiler (US Patent 5,573,842), is withdrawn.

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
  2. Ascertaining the differences between the prior art and the claims at issue.
  3. Resolving the level of ordinary skill in the pertinent art.
  4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
4. Claims 1, 2, 10-12, 14-16, 18, 20, 21, 23-41, 46-58, 61-68 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gutweiler (US Patent 5,573,842) in view of Dauvergne (FR Patent 2,401,941, Abstract), and Shohi et al. (EP-1036775 A1), and further in view of Degeilh (US 4,696,971).

*The invention of claims 1, 2, 10, 41-49, 58-65 relates to a **process for preparing a low color, polyvinyl butyral sheet** comprising the steps:*

*(I) **admixing polyvinyl alcohol, butyraldehyde, an acid or mixture of acids, water, and a surfactant;***

*(II) **stabilizing the mixture obtained in step (1) by (a) raising the pH of the mixture to at least pH 10. (b) isolating the polyvinyl butyral resin composition by draining the liquid, and (c) washing the polyvinyl butyral resin composition with neutral pH water;***

*(III) **plasticizing the PVB polyvinyl butyral resin composition with from about 30 to about 50 pph of plasticizer selected from the group consisting of***

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triethylene glycol di(2-ethylhexanoate), tetraethylene glycol diheptanoate, dibutyl sebacate, and mixture thereof, based on the dry weight of the resin;

(IV) **mixing (a) a PVB polyvinyl butyral bleaching compound** selected from the group consisting of organic bisulfites, inorganic bisulfites and sulfosuccinates, and, optionally, (b) an antioxidant and a UV light stabilizer with the polyvinyl butyral resin composition; and

(V) **extruding the PVG polyvinyl butyral resin composition** at a temperature of from about 175°C to about 225°C to obtain a polyvinyl butyral sheet having a **glass transition temperature ( $T_g$ )** of greater than about 32°C and a **YID of less than about 12**.

The invention of claims 14-16, 18-23 relates to a **plasticized polyvinyl butyral sheet composition** consisting essentially of:

**polyvinylbutyral having a hydroxyl (OH) number** of from about 15 to about 25;  
**a plasticizer** selected from the group consisting of triethylene glycol di(2-ethylhexanoate) tetraethylene glycol diheptanoate and dibutyl sebacate and mixtures thereof present in an amount of from about 30 pph to about 50 pph, based on the dry weight of the polyvinyl butyral resin;

**a compound** selected from the group consisting of organic bisulfites, inorganic bisulfites and sulfosuccinates.

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*The invention of claims 24, 25, 28, 31, 34, 40, 50, 54, 56 relates to a **process for preparing a low color, polyvinyl butyral sheet** comprising the steps:*

*(I) **admixing polyvinyl alcohol, butyraldehyde, an acid** or mixture of acids, water, and a surfactant selected from the group consisting of organic bisulfites,*

*inorganic bisulfites and sulfosuccinates;*

*(II) **stabilizing the mixture** obtained in step (1) by (a) **raising the pH of the mixture to at least pH 10**, (b) **isolating the resin by draining the liquid**, and (c) **washing the resin with neutral pH water**;*

*(III) **plasticizing the polyvinyl butyral resin composition** with from about 30 to about 50 pph of plasticizer selected from the group consisting of triethylene glycol di(2-ethylhexanoate), tetraethylene glycol diheptanoate, dibutyl sebacate, based on the dry weight of the polyvinyl butyral resin; and **extruding the polyvinyl butyral resin composition** temperature of from about 175°C to about 225°C to obtain a **polyvinyl butyral sheet** having a **glass transition temperature ( $T_g$ ) of greater than about 32°C** and a **YID of less than about 12**.*

*The invention of claims 11, 12, 26-27, 29-30, 32, 33, 35-39, 51-53, 55-56 relates to a process for preparing a low color, polyvinyl butyral sheet comprising the steps:*

*(I) **admixing polyvinyl alcohol, butyraldehyde, an acid** or mixture of acids, water, and **sodium dialkyl sulfosuccinate**;*

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(II) **stabilizing the mixture** obtained in step (1) by (a) raising the pH of the mixture to at least pH10, (b) isolating the resin by draining the liquid, and (c) washing the resin with neutral pH water;

(III) **plasticizing the polyvinyl butyral resin composition** with from about 30 to about 50 pph of plasticizer, based on the dry weight of the polyvinyl butyral resin, wherein the plasticizer is selected from the group consisting of triethylene glycol di(2-ethylhexanoate), tetraethylene glycol diheptanoate, dibutyl sebacate, and mixtures thereof; and **extruding the polyvinyl butyral resin composition** at a temperature of from about 175°C to about 225°C to obtain a polyvinyl butyral sheet having glass transition temperature ( $T_g$ ) of greater than about 32°C and a YID of less than about 12.

The invention of claims 66-68 relates to a **process for preparing a low color, polyvinyl butyral sheet** comprising the steps:

(I) **admixing polyvinyl alcohol, butyraldehyde, an acid or mixture of acids, water, and a surfactant** selected from the group consisting of organic bisulfites, inorganic bisulfites and sulfosuccinates;

(II) **stabilizing the mixture** obtained in step (1) by (a) raising the pH of the mixture to at least pH 10, (b) isolating the resin by draining the liquid, and (c) washing the resin with neutral pH water;

(III) **plasticizing the polyvinyl butyral resin composition** with from about 30 to about 50 pph of plasticizer selected from the group consisting of diesters obtained by

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(a) the reaction of triethylene glycol or tetraethylene glycol with aliphatic carboxylic acids having from 6 to 10 carbon atoms and (b) the reaction of sebacic acid with aliphatic alcohols having from 1 to 18 carbon atoms, and mixtures thereof, based on the dry weight of the polyvinyl butyral resin; and

**(IV) extruding the polyvinyl butyral resin composition at a temperature of from about 175°C to about 225°C to obtain a polyvinyl butyral sheet having a glass transition temperature ( $T_g$ ) of greater than about 32°C and a YID of less than about 12.**

The prior art to Gutweiler relates to a plasticized PVB film comprising a plasticizer, PVB, and an optical brightener in an amount effective to improve the optical properties and reduce the yellowing of the film which is useful as intermediate film in multilayer laminated glass panes (Abstract). Gutweiler's PVB sheet with a yellowness index of less than 2 (column 8, lines 4-5) is made by blending PVB with 20-50 wt% of plasticizer (column 4, line 1) and extruding under temperature of 140-250° C (column 4, line 12). The PVB has a content of vinyl alcohol monomer units of preferably 17-29 wt% (column 3, lines 41-43). Gutweiler (col. 3, line 59-62) clearly disclose the incorporation of the plasticizers as claimed.

The difference between the invention of claims 1, 2, 10-12, 14-16, 18, 20, 21, 23-41, 46-58, 61-68 and Gutweiler et al. is that Gutweiler is silent on the details of PVB synthesis, and is also silent on the use of sulfosuccinate compounds as surfactants.



Dauvergne teaches a process for preparing PVB comprising adding PVA, acid catalyst, and an emulsifier (i.e. a surfactant) into a reactor with stirring, introducing butyraldehyde gradually, then, after adjusting pH to 9-11, separating the resultant PVB from the mixture (Abstract). Although Dauvergne does not mention the wash step after PVB is separated from mixture as required by applicant's claim 1, the prior art to Shohi et al. provides an interlayer film for laminated glass containing PVB resin (Abstract and page 3, [0016]), where the PVB synthesis includes a step of reaction product wash with an excess of water in order to wash out the unreacted n-butyraldehyde and a neutralization of the hydrochloric acid catalyst with the common neutralizer (page 5, [0046]). Motivated by the expectation of success of obtaining a PVB resin with low residual monomers, it would have been obvious to one of ordinary skill in art to incorporate the washing step of Shohi et al. into the PVB preparation procedure of Dauvergne to obtain the PVB synthesis procedure as claimed.

Further, in light of the fact that Dauvergne teaches a detailed method of synthesizing PVB and Shohi et al. teach a similar PVB synthesizing process including a washing step, one having ordinary skill in the art at the time the invention was made would appreciate such teaching and, thus, to incorporate Dauvergne's method in Gutweiler's process of making a similar PVB laminate in combining with the method as taught by Shohi, because Dauvergne further detailed Gutweiler's method of synthesizing PVB and Shohi teaches the benefit of including one extra step of product

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washing and all three prior arts relate to the same subject matter, i.e. making a PVB laminated glass.

As to the glass transition temperature of the PVB sheet, as discussed above, given the substantially identity in the plasticized PVB composition between the prior art and the present invention, it is the examiner's position to believe that the prior art composition must inherently possess the same  $T_g$ . Since the PTO does not have proper means to conduct experiments, the burden of proof is now shifted to the applicant to establish an unobviousness difference. In re Best, 562 F.2d 1252, 195 USPQ 430 (CCPA 1977); In re Fitzgerald, 619 F.2d 67, 70, 205 USPQ 594, 596, (CCPA 1980).

Regarding claims 14-16, 18-23, the prior art to Gutweiler relates to a plasticized PVB film comprising a plasticizer, PVB, and an optical brightener in an amount effective to improve the optical properties and reduce the yellowing of the film which is useful as intermediate film in multilayer laminated glass panes (Abstract). Gutweiler's PVB sheet with a yellowness index of less than 2 (column 8, lines 4-5) is made by blending PVB with 20-50 wt% of plasticizer (column 4, line 1) and extruding under temperature of 140-250° C (column 4, line 12). The PVB has a content of vinyl alcohol monomer units of preferably 17-29 wt% (column 3, lines 41-43). Although Gutweiler is silent that the "surfactant employed is the type that performs the function of a bleaching compound or the polyvinyl butyral bleaching compound", applicants must recognize that the claimed

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invention relates to a plasticized polyvinyl butyral sheet composition and the how the claimed sheet product is bleach is a process-related limitation that has very little weight in the patentability of a product. Applicants must recognize that “[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process.” In re Thorpe, 777F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985).

Although the prior art references do not teach use of a specific surfactant or emulsifier in making PVB, Degeilh’ 971 teaches a process for the preparation of a PVB including using sodium dioctyl sulfosuccinate (DOS), effective as an emulsifier (Abstract). DOS advantageously facilitates the after-treatment of the PVB to separate the product (col. 2, line 15-23; col. 3, lines 19-20). More benefits of using such DOS emulsifier are described at col. 3, lines 20-52.

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to include a surfactant, such as DOS, as taught by Degeilh, in Gutweiler’s PVB formulation in order to take the advantage of such surfactant disclosed by Degeilh to obtain applicants’ claims 1, 2, 10-12, 14-16, 18, 20, 21, 23-41, 46-58, 61-68.

As to claim 10, it is noticed that sodium dioctyl sulfosuccinate, i.e. DOSS, is used as an emulsifier by Degeilh in the process of making PVB film (Abstract), which reads on the instant claim 10. Even though Degeilh does not specify that DOSS can also be used as a bleach agent, such functionality must be inherently processed by this compound. Finding a new property of the compound and such a discovery does not constitute a new invention. The courts have held that the fact that a characteristic is a necessary feature or result of a prior-art embodiment is enough for inherent anticipation, event if that fact was unknown at the time of the prior invention. *In Toro Co. v. Deere & Co.*, 355 F.3d 1313, 1320, 69 USPQ2d 1584, 1590 (Fed. Cir. 2004);; and *In Atlas Powder Co. v. Ireco, Inc.*, 190 F.3d 1342, 1348-49 (Fed. Cir. 1999).

As to claims 11-12, Gutweiler's process of dissolving or suspending optical brighteners in the plasticizer, mixing the plasticizers and optical brighteners with PVB can be seen at column 2, lines 12-16, which meets the instantly claimed "wet process". Shohi et als' disclosure on page 5, [0047], meets the instantly claimed "dry process".

As to claim 21, Shohi et al. disclose that supplementing the interlayer PVB film for laminated glass with additives is a conventional practice. The additives include ultraviolet absorber, light stabilizer, oxidation inhibitor, surfactant, colorant, etc. (page 4, [0033]). The oxidation inhibitor includes phenolic antioxidants, see page 4, [0036].

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5. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gutweiler (US Patent 5,573,842) in view of Dauvergne (FR Patent 2,401,941), in view of Shohi et al. (EP-1036775 A1), in view of Degeilh (US 4,696,971), and further in view of an online product brochure from Great Lakes Chemical Corporation, [www.pa.greatlakes.com](http://www.pa.greatlakes.com), 3<sup>rd</sup> Edition, October 2001.

The prior art references to Gutweiler, Dauvergne, Shohi et al. and Degeilh are adequately presented previously in this Office Action and are incorporated herein by reference. The aforementioned prior art references do not teach the instantly claimed antioxidant compound, i.e. 2,2-methylenebis (6-t-butyl-4-methylphenol).

Shohi et al. disclose that an antioxidant, such as phenolic antioxidant, among other additives, is conventionally incorporated in an interlayer film for laminated glass of this kind (page 4, [0033] and [0036]), while the online product brochure from Great Lakes Chemical Co. provides a list of nineteen antioxidants under the phenolic antioxidants category including 2,2'-methylenebis (6-t-butyl-4-methylphenol), which meets the instantly claimed compound. Including a phenolic antioxidant is a common practice in the art as clearly stated by Shohi et al. and finding a specific product from a chemical company's product brochure is well within the reach of a skilled person in the art. Therefore, it would have been obvious to those skilled in the art to employ such antioxidant in Gutweiler's PVB composition, motivated by a reasonable expectation of

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successfully obtaining the corresponding interlayer film containing PVB for laminated glass.

6. Claims 59-60 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gutweiler (US Patent 5,573,842) in view of Dauvergne (FR Patent 2,401,941), in view of Shohi et al. (EP-1036775 A1), in view of Degeilh (US 4,696,971), and further in view of Keppler (US 4,433,108).

Set forth from paragraph 5 of instant office action, claims 59-60 are similar to the claim 58 that has been 103 rejected. Particularly, Degeilh (col. 1, line 57-68; col. 2, line 15-23) clearly teach using sodium dioctyl sulfosuccinates as a surfactant or emulsifier.

The difference between the claims 59-60 and the rejected claim 58 is that Gutweiler, Dauvergne, Shohi et al. and Degeilh are silent on a process involving a bisulfite.

Keppler (col. 3, line 17-26) discloses the advantages of using a sodium bisulfite as a co-stabilizer with sodium dioctyl sulfosuccinates. Motivated by the expectation of success of using a sodium bisulfite as a co-stabilizer with sodium dioctyl sulfosuccinates, it would have been obvious to one of ordinary skill in art to add a sodium bisulfite which generically include both organic and inorganic sodium bisulfites, to the emulsifier teachings of Degeilh to obtain the invention of claims 59-60.

***Response to Arguments***

Applicant's arguments filed August 18, 2006 have been fully considered but they are not persuasive. Applicants argue that the prior art do not teach a bleaching compound, however, applicants fail to recognize that claims as written do not exclude an optical brightener as a bleaching compound.

Regarding applicants' argument that Degeilh (US 4,696,971) teaches away from the instantly claimed invention because Degeilh teaches a process involving a step of neutralizing to a pH of no more than 5. However, the examiner disagrees because applicants must recognize that Degeilh only teaches away of pH of no more than 5 when the product is used in applications where the ability to adhere to glass is critical. Since applicants' claims are not related to any glass adherence application, it would not be considered a teach away reference for one of ordinary skill in art not working on polymer products that are in the glass related applications. Therefore, the rejection set forth is proper.

***Conclusion***

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to William K. Cheung whose telephone number is (571) 272-1097. The examiner can normally be reached on Monday-Friday 9:00AM to 2:00PM; 4:00PM to 8:00PM.



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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David WU can be reached on (571) 272-1114. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



William K. Cheung, Ph.D.

Primary Examiner

October 9, 2006

**WILLIAM K. CHEUNG  
PRIMARY EXAMINER**